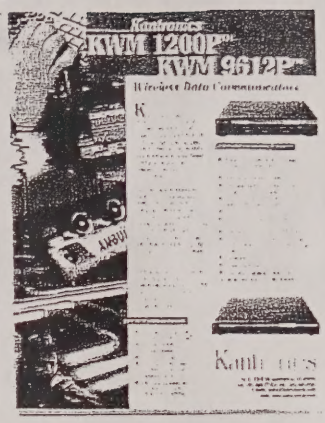
KANTRONICS KWM PRODUCTS



Attention Buyer!
Recently we have received several calls from individuals and companies who purchased the KPC-3 Plus for commercial applications. Please read the information below *before* installing your KPC-3 Plus for commercial applications.

The KWM-series of radio modems contains the AX.25 protocol found in the KPC-series plus other protocols that have the potential to be easily integrated into a variety of commercial applications. Although AX.25 packet is a very robust protocol and assures near error-free exchange of data between Data Terminal Equipment (DTE) devices, it is somewhat cumbersome to implement in commercial applications. AX.25 requires that the user learn a highly structured command set and the myriad of responses that can be received from the modem. Often, a long process of trial and error results in the realization that AX.25 may not be the most suitable protocol to use for a particular application.

Kantronics has developed the Transparent Unproto Packet (TUP) Mode, Poll Mode, Line Substitution (LINESUB) Mode, and Modem Mode protocols for the KWM-series in an effort to allow the modems to be more easily used with different types of installations. A brief descriptions of these modes follows.

Transparent Unproto Packet (TUP) Mode

The TUP mode protocol utilizes the Unproto mode of the AX.25 protocol, allowing digipeaters (VIA path specified with UNPROTO command) to be used in order to effectively extend the range of a radio data system beyond simplex distance. This protocol uses the standard AX.25 CRC-16 error checking to provide a high degree of data integrity. Data is sent and received in a totally transparent fashion, allowing all ASCII characters to be utilized (hex 00 through hex FF). Radio transmission is based on the PACTIME AFTER parameter setting of the modem, the setting of the carrier detect method, and the settings of the slot and persist channel access algorithm. Any data that is received by the modem via the radio is output to the serial port *only* if it contains no detectable errors. The received data will be *exactly* the same as the data that was set to the input serial port of the transmitting mode, without any address headers or added formatting of the data. The modem is capable of selectively filtering monitored data from or to different modem addresses using the BUDLIST command.

If digipeaters must be used to extend the range of the system, the information frame sent by any modems in the system will be output to the serial ports of the receiving modems only once, regardless of how many times it was received correctly. Also, data sent by any modem will not be decoded by itself when the data is digipeated. The TUP mode protocol provides an automatic "Time to Live" timer that inhibits any modem from transmitting or receiving additional data until sufficient time has expired to allow in-progress data to travel through all the digipeaters specified in the UNPROTO field of the originating modem. Since the time for a given packet to travel the entire UNPROTO path may vary due to the

presence of other signals or noise, TUPTIME is used to impose an additional delay time, if needed, during which each modem will be inhibited from decoding or transmitting new data. This setting can be determined experimentally. It is important to note that TUPTIME applies *only to receiving modems* and should be set to the same value at all sites. It is the responsibility of the host system to insure that additional data is not transmitted until sufficient time has elapsed to allow data to travel to the last digipeater and the response, if any, to travel back to the host. Note that the automatic "Time to Live" time and the TUPTIME timer are only in effect if packets are being digipeated.

Poll Mode

The POLL mode is generally used in system applications that implement a polled-response protocol between a central site (Control Site) and on or more remote locations (Remote Site). The POLL mode is similar to the TUP mode since it uses a data transparent broadcast mode and a packet protocol with CRC-16 error checking to insure the integrity of the received data. All ASCII characters (hex 00 through FF) can be transmitted and received. The POLL mode differs from TUP mode by allowing an application program to address specific locations without changing any modem parameters. All data sent by the application program at the central site must begin with the address (POLLID) of the intended remote modem. When any remote modem receives data from the radio, the data is checked for errors and the received POLLID is compared with its own POLLID. If they match, the POLLID is stripped and the data that follow is sent to the serial port. All data received by the central site from the remote locations will arrive with the POLLID of the remote site automatically attached to the beginning of the data.

It is the responsibility of the application program to: 1) address data to be sent to the remote sites, 2) determine if the data was received, and 3) recognize responses that contain the remote site's POLLID and data. *Digipeating is not allowed.*

Line Substitution (LINESUB) Mode

The LINESUB mode of operation provides a method of transmitting and receiving raw ASCII data via a radio. Data is sent and received in a totally transparent fashion, allowing all ASCII characters to be utilized (hex 00 through hex FF). There is no addressing, error-detection or automatic retransmission of the data. When the receiving modem detects the proper Start-of-Date sequence generated by the transmitting modem, it will output the data that follows to its serial port. At the end of the received data, there is an End-of-Data sequence that permits the receiving modem to recognize the end of the data and quit translating the receiver audio. This allows the modems to operate with open squelch audio from the radios. Since the protocol constitutes a very small portion of the transmission, the effective data throughput is very nearly that of the radio baud rate (HBAUD).

Modem Mode

It is important to note that when the MODEM mode is used, the modem is acting as a pure modulator/demodulator and uses the RTS and CTS lines of the serials port to control transmission of the data. There is *no* addressing, error correction, error detection, or flow control of the data as it is transmitted or received. The audio tones generated and received by the modem will directly mimic the data in composition and speed. Because of this, it is essential that all Data Terminal Equipment (DTE) associated with this mode have identical serial port parameters in use, e.g., 1200 baud, No parity, 8 data bits, 1 stop bit.

If you need any of the above-described protocols (or are not sure if you do), contact Kantronics Commercial Sales at 785-842-7745 (phone), 785-842-2031 (fax), or sales@kantronics.com (email). Quantity discounts are available for governmental and commercial sales.